NAIL MAGAZINE FOR NAILING GUN

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to nailing guns and, more specifically, to a nail magazine for nailing gun, which is practical for use with T-nails as well as U-nails.

2. Description of the Related Art

Regular nails for use in nailing guns include two types, namely, the T-nails and the U-nails. The nail magazines of regular nailing guns fit only one specific type of nails. Although there are nail magazines capable of accepting T-nails as well as U-nails, however these dual-use nail magazines are still not satisfactory in function.

FIG. 1 is a sectional front-end view of a dual-use nail magazine according to the prior art. According to this design, the dual-use nail magazine comprises a housing **1**, a nail guide **2**, a T-nail groove **3** and a U-nail groove **4** defined in the housing **1**. The longitudinal groove section **3a** of the T-nail groove **3** forms one side section **4a** of the U-nail groove **4**, i.e., the T-nail groove **3** is biased to one side of the U-nail groove **4** relative to the axis **L** of the path of the firing pin **5** of the nailing gun. As illustrated in FIG. 1, the whole area of the top side of the U-nail **6** receives compact from the bottom side of the firing pin **5**, i.e., the U-nail **6** is evenly forced into the workpiece. When driving a T-nail **7** as shown in FIG. 2, the top side of the T-nail **7** receives impact from only a part of the bottom side of the firing nail **5**, i.e., the pressure of the firing pin **5** is not evenly applied to the T-nail **7**, and the T-nail **7** tends to be deformed during nailing.

Further, the aforesaid nail magazine is not suitable for accommodating big-size T-nails **7** because excessive long T-nails tend to be deformed during nailing. According to this design, the longitudinal groove section **3a** of the T-nail groove **3** is

made equal to the height **4a** of the U-nail groove **4**. This design limits the application range of the nail magazine.

Therefore, it is desirable to provide a nail magazine that eliminates the aforesaid problems.

SUMMARY OF THE INVENTION

It is therefore the main object of the present invention to provide a nail magazine that fits T-nails as well as U-nails.

It is another object of the present invention to provide a nail magazine that keeps the nails in coincidence with the axis of the path of the firing pin.

It is still another object of the present invention to provide a nail magazine that fits different sizes of T-nails.

To achieve these objects of the present invention, the nail magazine for alternatively accommodating T-nails or U-nails comprises a housing having a receiving chamber therein, a nailing track fastened to a front end of the housing and provided with a bottom notch in alignment with the receiving chamber, a nail guide mounted in the receiving chamber for support nails loaded in the housing, a nail pusher mounted inside the housing for pushing the loaded nails toward the bottom notch of the nailing track, and a stop block. The nailing track further comprises a first nail hole upwardly extended from the bottom notch. The stop block is positioned in the bottom notch of the nailing track. The stop block has a top side, a left side and a right side, which define with a peripheral wall of the bottom notch of the nailing track a second nail hole. The stop block further has a top cut groove downwardly extended from the top side thereof and in alignment with the first nail hole. When T-nails are used and loaded in the housing, the loaded T-nails are forced by the nail pusher to pass through

the first nail hole and the top cut groove. When U-nails are used and loaded in the housing, the loaded U-nails are forced by the nail pushers to pass through the second nail hole.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a sectional front-end view of a dual-use nail magazine according to the prior art.

FIG. 2 is similar to FIG. 1 but showing T-nails used instead of U-nails.

FIG. 3 is an exploded view of a nail magazine according to the present invention.

FIG. 4 is a perspective view showing the housing of the nail magazine coupled with the nail guide according to the present invention.

FIG. 5 is a perspective view showing a firing pin coupled to the nailing track of the nail magazine according to the present invention.

FIG. 6 is a front view of FIG. 5.

FIG. 7 is a perspective view in an enlarged scale of the clamp shown in FIG. 3.

FIG. 8 is similar to FIG. 5 but showing the T-nail in the firing position.

FIG. 9 is a front view of FIG. 8.

FIG. 10 is similar to FIG. 9 but showing the T-nail driven out of the nail magazine.

FIG. 11 is similar to FIG. 9 but showing the U-nail in the firing position.

FIG. 12 is similar to FIG. 11 but showing the U-nail driven out of the nail magazine.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG.S. 3~7, a nail magazine **100** fits T-nails **101** (see FIG. 9) as well as U-nails **102** (see FIG. 12), and the firing pin **103** of the nailing gun (not shown) can smoothly drive the loaded nails out of the nail magazine **100**. The nail magazine **100** is comprised of a housing **10**, a nailing track **20**, a nail guide **30**, a stop block **40**, a nail clamp **50**, and a nail pusher **60**.

The housing **10** is comprised of flat, narrow, elongated shells **11** and **12** each having a plurality of grooves extended on the respective inner along the length surface such that when the shells **11** and **12** fastened together, as shown in FIG. 4, a T-nail groove **13** is formed in the upper part of the housing **10** and a receiving chamber **14** is formed in the lower part of the housing **10** for accommodating the nail guide **30**. The T-nail groove **13** has a plurality of transverse groove sections **131** disposed at different elevations and respectively adapted to accommodate the head **101a** of one of different sizes of T-nails **101** (see also FIG. 9), and one longitudinal groove section **132** adapted to accommodate the nail body **101b** of any of the aforesaid different sizes of T-nails **101**. The bottom end of the longitudinal groove section **132** is in communication with the aforesaid receiving chamber **14**. Further, it is to be understood that the longitudinal groove section **132** of the T-nail groove **13** is disposed in the mid point between the shells **11** and **12** of the housing **10**.

The nailing track **20** is fixedly fastened to the front end of the housing **10** with pins **26**, as shown in FIGS. 5 and 6. The nailing track **20** comprises a sliding groove **22** longitudinally formed in the front side **21** for guiding vertical movement of the firing pin **103**, a bottom notch **23** cut through the front side **21** and the rear side **24**

in communication between the bottom end of the sliding groove **22** and the receiving chamber **14**, and a first nail hole **25** longitudinally formed in the sliding groove **22** on the middle and upwardly extended from the bottom notch **23**. The first nail hole **25** has a profile fitting the transverse groove sections **131** and the longitudinal groove section **132**.

The nail guide **30** is a narrow elongated member movable in and out of the aforesaid receiving chamber **14**, having a rear finger tip **31** for the holding of the user's hand, two upright sidewalls **32**, and a guide groove **33** defined between the upright sidewalls **32**. After installation of the nail guide **30** in the housing **10**, the guide groove **33** is set in alignment with the longitudinal groove section **132** of the T-nail groove **13**. The guide groove **33** is adapted to accommodate the lower part of the nail body **101b** of a T-nail **101**. The two upright sidewalls **32** are adapted to support U-nails **102**.

The stop block **40** is fixedly fastened to the front end of the nail guide **30**. After installation of the nail guide **30** in the housing **10**, the stop block **40** is received in the bottom notch **23** of the nailing track **20**, keeping the front side **41** of the stop block **40** in flush with the bottom side of the sliding groove **22**, as shown in FIG. 5. As shown in FIG. 6, the top, left and right sides of the stop block **40** define with the peripheral wall of the bottom notch **23** a second nail hole **42** for receiving an U-nail. The stop block **40** further has a top cut groove **43** downwardly extended from the top side in communication with the first nail hole **25**.

Referring to FIG. 7, the nail clamp **50** is pivoted to the front end of the nail guide **30** by a pivot pin **51**, comprising two parallel clamping walls **52** and **53**. The clamping walls **52** and **53** each have a front side sloping downwardly forwards. When the nail magazine **100** assembled, the clamping walls **52** and **53** have the respective front sides inserted into the top cut groove **43** of the stop block **40**. As shown in FIG. 5,

before down stroke of the firing pin **103**, the bottom edges **52a** and **53a** of the front sides of the clamping walls **52** and **53** protrude over the front side **41** of the stop block **40**. During down stroke of the firing pin **103**, the firing pin **103** forces the nail clamp **50** to turn about the pivot pin **51** in one direction and to move to the inside of the cut groove **43**, and therefore the nail clamp **50** does not interfere with the firing action of the firing pin **103**.

The nail pusher **60** is mounted inside the housing **10**, comprising a push member **61** and a spring **62**. The push member **61** is comprised of a channel plate **611** and a vertical plate **612**. The vertical plate **612** is directly fastened to the channel plate **611**. The channel plate **611** is riding on the upright sidewalls **32** of the nail guide **30**, having an invertedly disposed U-shaped front push face **611a**. The vertical plate **612** has the upper part suspended in the longitudinal groove section **132** of the T-nail groove **13**, and the lower part suspended in the guide groove **33** of the nail guide **30**, having a longitudinal push face **612a**. The spring **62** is adapted to impart a forward push force to the push member **61**, causing the push member **61** to push T-nails **101** or U-nails **102** toward the first nail hole **25** or the second nail hole **42**.

The use of the nail magazine **100** with T-nails **101** or U-nails **102** is outlined hereinafter. When T-nails **101** are used and loaded in the nail magazine **100**, as shown in FIGS. 8 and 9, they are immediately forced forwards by the longitudinal push face **612a** of the vertical plate **612** of the nail pusher **60**, thereby causing the first T-nail **101** to protrude over the sliding groove **22** of the nailing track **20** through the first nail hole **25** and the gap between the clamping walls **52** and **53**, and at the same time the lower part of the body **101b** of the first T-nail **101** is clamped by the bottom edges **52a** and **53a** of the front sides of the clamping walls **52** and **53** of the nail clamp **50**. Because the body **101b** of the T-nail **101** is maintained in coincidence with the axis **L** of the

path of the firing pin **103,** as shown in FIG. 10, the T-nail **101** is straightly and positively driven into the workpiece (for example, wooden material) upon down stroke of the firing pin **103**.

When U-nails **102** are used and loaded in the nail magazine **100,** as shown in FIG. 11, they are immediately forced forwards by the invertedly disposed U-shaped front push face **611a** of the channel plate **611**, thereby causing the first U-nail **102** to protrude over the sliding groove **22** of the nailing track **20** through the second nail hole **42**, and the first U-nail **102** is straightly and rapidly driven into the workpiece upon down stroke of the firing pin **103** (see FIG. 12).

As indicated above, the invention has the following advantages.

1. The nail magazine **100** is suitable for use with T-nails **101** as well as U-nails **102**. When T-nails **101** are used, the nail body **101b** of the T-nail shifted to the firing position is maintained in coincidence with the axis of the path of the firing pin **103**, and therefore the T-nail can straightly and positively be driven into the workpiece.

2. When T-nails **101** are used and loaded in the nail magazine **100**, the nail clamp **50** holds the nail body **101b** of the T-nail **101** in the firing position for driving by the firing pin **103**, and is smoothly turned away from the path of the firing pin **103** for enabling the T-nail **101** to be driven into the workpiece straightly and positively upon down stroke of the firing pin **103**.

3. The nail magazine **100** fits T-nails of different sizes, more particularly T-nails of length greater than the height of the U-nails.